

4,950,583 to Brewer et al. Claims 2-3, 5, and 7-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over the '301 patent to Powers et al. in view of the '928 patent to Rogers et al., the '588 patent to Verley et al., the '214 patent to Murthy et al., the '583 patent to Brewer et al., and further in view of U.S. Patent No. 6,448,313 to Patel. Claim 20 was rejected under 35 U.S.C. §103(a) as being unpatentable over the '301 patent to Powers et al. in view of the '928 patent to Rogers et al., the '588 patent to Verley et al., the '214 patent to Murthy et al., and further in view of U.S. Patent No. 5,677,063 to Kamiyama et al. and U.S. Patent No. 6,409,312 to Mrvos et al. Claims 13-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over the '301 patent to Powers et al. in view of the '928 patent to Rogers et al., the '588 patent to Verley et al., the '214 patent to Murthy et al., the '063 patent to Kamiyama et al., and the '312 patent to Mrvos et al., and further in view of the '313 patent to Patel. Claims 17-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over the '301 patent to Powers et al. in view of the '928 patent to Rogers et al., the '588 patent to Verley et al., the '214 patent to Murthy et al., the '063 patent to Kamiyama et al., and the '312 patent to Mrvos et al.

Claims 2-7, and 13-20 Are Patentable Over the Cited References.

In all of the §103(a) rejections set forth above, U.S. Patent No. 6,402,301 to Powers et al. is cited as the primary reference. However, as evidenced by declarations previously filed on December 31, 2002, and mailed on February 6, 2003, by the inventors, Shauna M. Leis, and Brian C. Hart, the invention was conceived of prior to the filing date of the '301 patent and was diligently reduced to practice. Applicants did not submit the evidence earlier because they were under the impression that the statement in the Invention Disclosure Record on page 2 of 3, at the end of the third paragraph that "Ninety degree peel test results and visual inspections of ink channels have shown better bulk and nozzle area adhesion even after accelerated ink soak tests," was sufficient evidence that parts were made using the invention and thus the invention was reduced to practice. Otherwise, how could inspections and peel tests be made? The key feature of the invention that was demonstrated before the filing date of the '301 patent was the use of a water-soluble coating material to protect the silicon wafer prior to grit blasting.

In the declaration submitted with the response filed on December 31, 2002, the declarant, Brian Hart, made the statement that the inventors "... have been diligent in pursuing the invention up to and including the filing date of this application, namely August 14, 2001."

Nevertheless, in order to erase any doubts that the invention was reduced to practice diligently, applicants submitted another declaration including notebook pages and photomicrographs evidencing reduction to practice of the invention. Some of the dates redacted from the notebook pages are before October 27, 2000, and the dates on the last written page of the notebook pages and the photomicrograph pages are dated less than two months after October 27, 2000. It is submitted that the foregoing declaration, notebook pages, and Invention Disclosure Record are sufficient to also establish reduction to practice of the invention. Having thus removed the primary reference as prior art in all of the rejections, it is submitted that the rejections of claims 2-7, and 13-20 are untenable and should be withdrawn.

All of the rejections of claims 2-7 and 13-18 also cite the '928 patent to Rogers et al. and the '588 patent to Verley et al. These references are not properly combined to reject the claims. Accordingly, the examiner has failed to make out a prima facie case of obviousness.

Specifically, no evidence has been presented that laser drilling a silicon substrate as provided by the '928 patent to Rogers et al. is equivalent to the use of abrasive particles to form opening or holes in a silicon substrate. The mechanisms are entirely different. For one, laser drilling and ultrasonic drilling do not use particles at high speed to impact and abrade a surface. Laser drilling and ultrasonic drilling causes decomposition of the material being drilled which is then redeposited as slag particles on the surface of the material.¹ There is no need for the surface coating to be of any particular thickness because it is not likely that redeposited slag from laser drilling or ultrasonic drilling will penetrate into a relatively thin protective layer on the surface. There is nothing in the '928 patent with regard to fabrication of ink jet heater chips, or the use of grit blasting to form slots in ink jet heater chips, and thus there is no motivation to combine the '928 patent with any of the other references cited in the rejections of claims 2-7 and 13-20.

¹ See column 7, lines 7-10 of the '214 patent for example with regard to decomposition products depositing on a surface being laser ablated.

In contrast to laser and/or ultrasonic drilling, grit blasting involves impacting the surface with abrasive particles at high speed to erode an opening in the silicon or material. Such a process is unlike laser drilling or ultrasonic welding. In view of the use of abrasive particles to form slots or openings in a silicon wafer, applicants devised a multiple layer coating system to protect the silicon and delicate electronic components. This inventive concept is not suggested or described in the combination of references.

With respect to the statement that laser and/or ultrasonic drill systems are "art recognized equivalents for the purpose of forming vias in an ink-jet semiconductor chip," the '588 patent itself leads away from this conclusion. In column 1, lines 27-31, it is stated with respect to laser and/or ultrasonic drill systems that "... these methods have not proven to be efficient or economical." Whereas the use of abrasive particles is the system of choice in the '588 patent. Accordingly, it is error to assert that the '588 reference recognizes that laser and/or ultrasonic drill systems are equivalent to grit blasting.

There is also nothing in the '588 patent with regard to protection of the surface of the substrate with any material much less applicants' claimed materials prior to grit blasting. The only motivation to use such protective materials comes from applicants' disclosure, not from the prior art.

The other references are likewise not properly combined to reject the claims. For example, the '313 patent to Patel provides absolutely no motivation to combine the protective materials disclosed therein with the laser drilling step described in the '928 patent. There is nothing in the '313 patent with regard to forming openings or holes in a silicon wafer or substrate. The only motivation to make the combination comes from applicants' disclosure not from the prior art.

The '214 patent to Murthy et al. is also directed to laser drilling rather than grit blasting and is thus no more relevant than the '928 patent to Rogers et al. The '312 patent to Mrvos et al. is not prior art with respect to the invention for the same reasons that the '301 patent to Powers et al. is not prior art. The other references cited against claims 2-7 and 13-20 are cited only for the disclosure of specific components of the claimed invention, and do not suggest use of protective layers for grit blasting slots in silicon wafers.

In all of the rejections, the examiner is relying on hindsight reconstruction of the invention to reject the claims. It is well settled law that there must be some showing of a suggestion, teaching or motivation to combine the prior art references. See, In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) citing Brown & Williamson Tobacco Corp v. Philip Morris Inc., 56 USPQ2d 1456, 1459 (Fed. Cir. 2000). The courts have also stated that "Our case law makes clear that the best defense against the subtle but powerful attraction of hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references." In re Dance, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998).

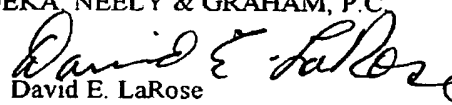
Finally, the examiner states that "Regarding the step of grit blasting, it would have been obvious to one of ordinary skill in the art at the time of invention to grit blast the vias from the side of the wafer that does not contain the resistive conductive and insulative layers" However, the examiner has failed to provide one iota of evidence that this statement is true. The courts require that when reliance is made on ". . . general knowledge to negate patentability, that knowledge must be articulated and placed on the record. . . ." The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies." See, In re Lee, *Ibid.*, at 1435. It was error for the examiner to state what he believes is known by those skilled in the art without providing concrete evidence of that knowledge.

In the event this response is not timely filed, Applicants hereby petition for the appropriate extension of time and request that the fee for the extension along with any other fees which may be due with respect to this paper be charged to our **Deposit Account No. 12-2355**.

Respectfully submitted,

LUEDEKA, NEELY & GRAHAM, P.C.

By:


David E. LaRose
Registration No. 34,369

February 7, 2003
P.O. Box 1871
Knoxville, Tennessee 37901
(865) 546-4305
F:\56202\56202.US.AmdBSupp.Feb07.doc

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David E. LaRose
David E. LaRose, Reg. No. 34,369

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